

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
28 October 2004 (28.10.2004)

PCT

(10) International Publication Number
WO 2004/092771 A2

(51) International Patent Classification⁷: **G01V**

(21) International Application Number: **PCT/EP2004/050527**

(22) International Filing Date: 15 April 2004 (15.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 0308632.9 15 April 2003 (15.04.2003) GB

(71) Applicant (for AE, AG, AL, AM, AT, AU, AZ, BA, BB, BE, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, SZ, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW only): WESTERNGEICO SEISMIC HOLDINGS LIMITED; Citco Building, PO Box 662, Roadtown, Tortola (VG).

(71) Applicant (for FR only): SERVICES PETROLIERS SCHLUMBERGER [FR/FR]; 42, rue Saint-Dominique, F-75007 Paris (FR).

(72) Inventors; and

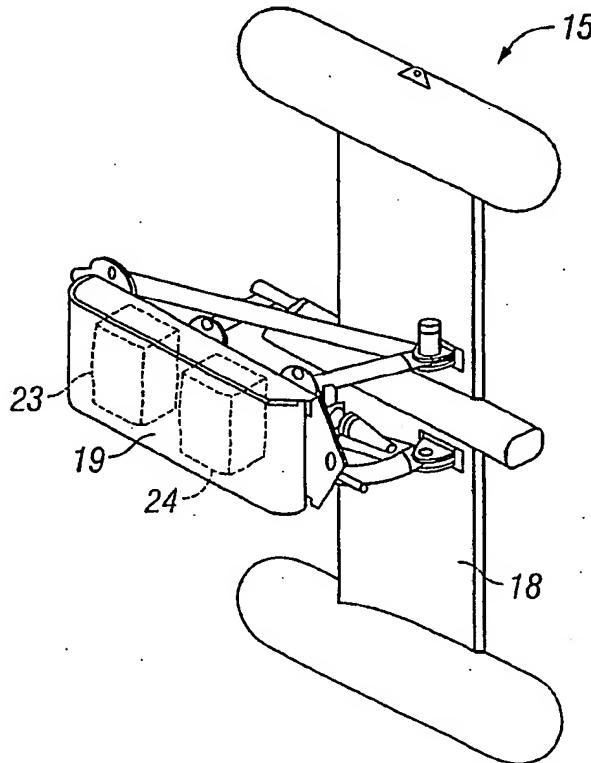
(75) Inventors/Applicants (for US only): HOWLID, Martin [NO/NO]; Asta Hanssens vei 106, N-1341 Slepden (NO). SINGH, Rohitashva [IN/NO]; Damstredet 2, N-0177 Oslo (NO).

(74) Agent: SUCKLING, Andrew; Marks & Clerk, 4220 Nash Court, Oxford Business Park South, Oxford Oxfordshire OX4 2RU (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

[Continued on next page]

(54) Title: ACTIVE STEERING FOR MARINE SEISMIC SOURCES



(57) Abstract: A seismic survey system having a source array (11) coupled to a deflector device (15) that controls the position of the source array. A positioning system unit (16) is mounted on the source array to provide a signal to a controller, informing the controller of the current position of the source array so that the controller can control the position of the deflector device (15) and the coupled source array. A seismic source (14) on the source array may be triggered when the source array is at a desired location as measured by the positioning system unit. The deflector device (15) comprises one or more wings (18) in a generally vertical or, alternatively, in a generally horizontal arrangement disposed adjacent to a central body (19). The streamlined central body has connection points that allow the deflector device (15) to be connected to a tow cable (13) from the tow vessel (12) and to the source array (11).

WO 2004/092771 A2



AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.